

CLAIMS:

1. A method for determining a value of a first counter of a wireless communication system serving a user station which moves at a time of handover from a first coverage area controlled by a first controller into a second coverage area controlled by a second controller, the method comprising:

maintaining in the first controller, substantially until the time of the handover, the value of the first counter which is incremented periodically,

sending, at substantially the time of handover, a request to the user station for a constant value representing a difference between the value of the first counter and a value of a second counter, the value of the second counter being maintained in the second coverage area and incremented periodically with the first counter; and

receiving an updated value of the second counter at a later time at the second controller and determining an updated value of the first counter at that later time based on the constant value, the value of the first counter at the time of handover and the value of the second counter at the later time.

2. The method according to any claim 1, wherein the first controller receives the constant value and sends a container message to the second controller comprising the constant value and an identifier indicating the second coverage area.

3. The method according to claim 1, wherein the first controller receives the constant value, determines the value of the second counter substantially at the time of handover based on the constant value, and sends a container message comprising the value of the second counter substantially at the time of handover to the second controller.

4. The method according to claim 3 wherein the container message further comprises the values of the first counter substantially at the time of handover and an identifier indicating the second coverage area.

5. The method according to claim 4, wherein the second controller receives over a paging channel from the identified second coverage area, the updated value of the second counter at the later time.

6. The method according to claim 1, wherein a first and a second set of bearer channels are used to transfer data between the user station and the corresponding first and second controller stations.

7. The method according to claim 6, wherein the updated value of the first counter is an input of a coding function for coding the data to be transferred over the first and second sets of bearer channels.

8. The method according to claim 6, wherein the data is transferred according to a transparent radio link control mode of operation.

9. The method according to claim 7, wherein the coding function further comprises at least one of the following inputs: a ciphering key, a length indicator, a direction indicator and a bearer channel identifier.

10. The method according to claim 1, wherein the value of the first counter is a COUNT-C value.

11. The method according to claim 1, wherein the first counter has thirty-two bits of which twenty-four most significant bits represent a hyper frame number (HFN) value and eight least significant bits represent a connection frame number (CFN) value.

12. The method according to claim 11, further comprising a checking step performed by comparing the CFN value of the first counter determined at the later time with an actual CFN value maintained independently in the second controller, wherein if the compared values are different, a predetermined value is added to the value of the first counter determined at the later time.

13. The method according to claim 11, wherein the second counter has 12 bits representing a system frame number (SFN) value.

14. The method according to claim 13, wherein the SFN value is equivalent to the CFN value plus an offset value.

15. The method according to claim 1, wherein each of the first and second controllers has at least one base station, each base station having at least one transceiver arranged to provide the corresponding coverage area.

16. The method according to claim 15, wherein a first transceiver in a first base station provides the first coverage area and a second transceiver in a second base station provides the second coverage area, the first and second base stations being controlled by the corresponding first and second controllers.

17. The method according to claim 1, wherein the first controller sends a measurement control message to the user station comprising the request for the constant value, and wherein the user station responds with a measurement report message comprising the constant value.

18. A wireless communication system for serving a user station, the wireless communication system comprising:

a first controller for controlling a first coverage area and a second controller for controlling a second coverage area, wherein at a time of handover the user station moves from the first into the second coverage area;

the first controller having a first counter whose value is incremented periodically substantially until the time of handover, and wherein substantially at the time of handover a request is sent to the user station for a constant value representing a difference between the first counter and a second counter, wherein a value of the second counter is maintained in the second coverage area and is incremented periodically with the first counter; and

the second controller receiving an updated value of the second counter at a later time and determining the value of an updated first counter at that later time based on the constant value, the value of the first counter at the time of handover and the value of the second counter at the later time.

19. The system according to claim 18, wherein each of the first and second controllers include a ciphering unit arranged to receive the updated value of the first counter as an input for coding data to be transferred between the user station and the corresponding first and second controllers.

20. The system according to claim 19, wherein the first controller includes a handover unit arranged to determine which of the first and second coverage area is the best for handover.

21. The system according to claim 20, wherein the best coverage area is an area having a greatest transmitted power value.

22. The system according to claim 18, wherein the wireless communication system is a UMTS system, wherein the user station is user

equipment, wherein the first and second controllers are radio network controllers and wherein the system further includes base stations which are Node B elements.

23. A method for determining a value of a first counter of a wireless communication system serving a user station which moves at a time of handover from a first coverage area controlled by a first controller into a second coverage area controlled by a second controller, the method comprising:

- maintaining in the first controller substantially until the time of the handover the value of the first counter which is incremented periodically;

- sending from the first controller, at substantially the time of handover, a request to the user station for a constant value representing a difference between the value of the first counter and a value of a second counter, the value of the second counter being maintained in the second coverage area and incremented periodically with the first counter;

- receiving at the first controller said constant value for determining the value of the second counter at substantially the time of handover and sending said values of the first and second counters at the time of handover to the second controller; and

- receiving at the second controller at a later time said values of the first and second counters from the first controller, the second controller also receiving an updated value of the second counter at the later time and determining from the received values an updated value of the first counter at that later time.

24. A method of determining the value of a first counter for handover, the value of the first counter being for encoding data transferred between a user station and a first base station controlled by a first controller

and, for encoding data transferred between the user station and a second base station controlled by a second controller, the method comprising the steps of:

a) sending from the user station to the first controller a constant value representing the difference between the value of the first counter and the value of a second counter;

b) identifying at the first controller the value of the first counter before handover;

c) calculating at the first controller the value of the second counter before handover based on said identified value of the first counter and the constant value, and sending said calculated value of the second counter to the second controller;

d) identifying at the second controller the latest value of the second counter upon receiving the calculated value of the second counter; and

e) calculating at the second controller the latest value of the first counter based on the identified value of the first counter before handover, the calculated value of the second counter before handover and the latest value of the second counter.

25. The method according to claim 24, wherein for step d) the second controller receives an identity of the second coverage area and determines over a paging channel the updated value of the second counter at the later time.

26. The method according to claim 24, wherein for step e) the second controller calculates the latest value of the first counter by finding the difference between the value of the second counter before handover and the latest value of the second counter, and adding the difference to the value of the first counter before handover.

27. The method according to claim 24, wherein the values of the first and second counters being periodically incremented concurrently every 10ms.

28. A method of determining the value of a first counter for handover, the value of the first counter is for encoding data transferred between a user station and a first base station controlled by a first controller and, for encoding data transferred between the user station and a second base station controlled by a second controller, the method comprising the steps of:

a) sending from the user station to the first controller a constant value representing the difference between the value of the first counter and the value of a second counter;

b) identifying at the first controller the value of the first counter before handover;

c) sending to the second controller the constant value and the value of the second counter before handover;

d) upon receiving said values, identifying the latest value of the second counter; and

e) calculating at the second controller the latest value of the first counter based on the identified value of the first counter before handover, the calculated value of the second counter before handover and the latest value of the second counter.